Claims:

1. The use of one or more complex fluoro acids of silicium and/or anions thereof in concentrations from 30 to 500 millimoles per liter in process solutions used for brightening and/or passivating pickled surfaces of stainless steel.

2. The use according to claim 1, wherein the complex fluoro acids and/or anions thereof are used in concentrations from 30 to 300 millimoles per liter.

3. A process for brightening and/or passivating of pickled surfaces of stainless steel, wherein the pickled surfaces are brought into contact with a process solution comprising:
   a) one or more strong acids other than the complex fluoro acids of group c),
   b) one or more oxidizing agents,
   c) one or more complex fluoro acids of elements of groups 4, 13, or 14 of the periodic table of the chemical elements and/or anions thereof in concentrations from 50 to 300 mmoles per liter.

4. A process for brightening and/or passivating of pickled surfaces of stainless steel according to claim 3 wherein the oxidizing agent b) is selected from compounds containing a peroxo-group, and which additionally comprises
   d) a hydrogen peroxide stabilizer.

5. A process for brightening and/or passivating of pickled surfaces of stainless steel according to at least one of claims 3 or 4, wherein
   a) the strong acid is present in a concentration from 2 to 100 g/l, and
   b) the oxidizing agent is present in a concentration, expressed as the equivalent concentration of H_2O_2, in the range from 1 to 30 g/l.

6. A process solution for pickling steel comprising:
   a) one or more strong acids other than the complex fluoro acids of group c), and different from nitric acid, in a total concentration of at least 10 g/l and at most 200 g/l.
   c) one or more complex fluoro acids of Si and/or anions thereof in concentrations from 50 to 500 mmoles per liter,
   e) iron(III) cations in concentrations from at least 3 g/l, preferably at least 5 g/l, more

preferably at least 10 g/l, to at most 100 g/l, more preferably at most 60 g/l,
and, optionally,
d) a hydrogen peroxide stabilizer,
the process solution containing in addition such an amount of fluoride ions and/or hydrofluoric acid that at least 1 % and up to 100 % of the iron(III) ions are present in the form of fluoride complexes, but that it contains less than 10 g/l, preferably less than 5 g/l, more preferably less than 1 g/l of the total of free fluoride ions and/or free hydrofluoric acid.

7. A process solution according to claim 6 which contains no other oxidizing agent than the iron(III) ions and dissolved oxygen.

8. A process solution according to one or both of claims 6 and 7 which additionally contains a total of from 0.1 to 10 g/l of chloride ions and/or hydrochloric acid.

9. A process solution according to one or more of claims 6 to 8 which has a redox potential, measured at its working temperature with a Pt/Ag/AgCl electrode, of at least 280 mV, preferably of at least 300 mV, and up to 800 mV.

10. A process for pickling steel, wherein the steel is brought into contact with a process solution according to one or more of claims 6 to 9.

11. A process according to claim 10 wherein the process solution is moved relatively to the surface of the steel.

12. A process according to one or both of claims 10 and 11 wherein at least a fraction of the iron(II) ions formed during the pickling are oxidized to iron(III) ions.

13. The use, process solution, or process according to any of the preceding claims, wherein the strong acids other than the complex fluoro acids of group c) are selected from sulfuric acid, phosphoric acid, and mixtures thereof.

14. The use, process solution, or process according to any of the preceding claims, wherein the process solution is in the form of a gel or a paste.

15. A replenisher solution for a process solution according to one or more of claims 6 to 8, comprising

a) one or more strong acids other than the complex fluoro acids of group c), and different from nitric acid

c) one or more complex fluoro acids of silicium and/or anions thereof,

in concentrations higher than those defined in claim 6,

and fluoride ions and/or hydrofluoric acid in a concentration above zero, but in such a maximum concentration that the process solution after the addition of the replenisher solution contains such an amount of fluoride ions and/or hydrofluoric acid that at least 1 % and up to 100 % of the iron(III) ions are present in the form of fluoride complexes, but that it contains less than 10 g/l, preferably less than 5 g/l, more preferably less than 1 g/l of the total of free fluoride ions and/or free hydrofluoric acid.